

costvar, c
termvar, x, y, z, f
baseAttackVar, b
index, i, j, k

$op ::=$
 $| \text{op}_{\odot}$
 $| \text{op}_{\triangleright}$
 $| \text{op}_{\sqcup}$
 $| \text{rel}_{\rightarrow}$
 $| \text{rel}_{\leftarrow}$
 $| \text{rel}_{\multimap}$
 $| \text{rel}_{\rightarrow}(c, -)$
 $| \text{rel}_{\leftarrow}(c, -)$
 $| \text{rel}_{\multimap}(c, -)$
 $| \text{rel}_{\multimap\multimap}(c, -)$

$C ::=$
 $| c$
 $| op(C_1, C_2)$

$T ::=$
 $| b$
 $| T_1 \odot_{\text{op}_{\odot}} T_2$
 $| T_1 \triangleright_{\text{op}_{\triangleright}} T_2$
 $| T_1 \sqcup_{\text{op}_{\sqcup}} T_2$
 $| (T)$

$E ::=$
 $| b$
 $| E_1 \odot_{\text{op}_{\odot}} E_2$
 $| E_1 \triangleright_{\text{op}_{\triangleright}} E_2$
 $| E_1 \sqcup_{\text{op}_{\sqcup}} E_2$
 $| E_1 \rightarrow_{\text{rel}_{\rightarrow}(c, -)} E_2$
 $| E_2 \leftarrow_{\text{rel}_{\leftarrow}(c, -)} E_1$
 $| E_1 \multimap_{\text{rel}_{\multimap}(c, -)} E_2$
 $| E_1 \multimap\multimap_{\text{rel}_{\multimap\multimap}(c, -)} E_2$
 $| (E) \quad \text{S}$

$\Gamma, \Delta, \Theta, \Psi ::=$
 $| \cdot$
 $| (E, c)$
 $| \Theta, \Psi$

$\boxed{\Gamma; \Delta \vdash_C T}$

$\frac{}{\cdot; (b, c) \vdash_c b} \text{ T_VAR}$

$\frac{}{(b, c); \cdot \vdash_c b} \text{ T_VARC}$

$\frac{\Gamma_1; \Delta_1 \vdash_{c_1} T_1 \quad \Gamma_2; \Delta_2 \vdash_{c_2} T_2}{\Gamma_1, \Gamma_2; \Delta_1, \Delta_2 \vdash_{\text{op}_{\odot}(c_1, c_2)} T_1 \odot_{\text{op}_{\odot}} T_2} \text{ T_PARA}$

$$\frac{\Gamma_1; \Delta_1 \vdash_{c_1} T_1 \quad \Gamma_2; \Delta_2 \vdash_{c_2} T_2}{\Gamma_1, \Gamma_2; \Delta_1, \Delta_2 \vdash_{\text{op}_{\triangleright}(c_1, c_2)} T_1 \triangleright_{\text{op}_{\triangleright}} T_2} \text{ T_SEQ}$$

$$\boxed{\Theta; \Psi \vdash_C E}$$

$$\frac{}{\vdash; (E, c) \vdash_c E} \text{ E_VAR}$$

$$\frac{}{(E, c); \cdot \vdash_c E} \text{ E_VARC}$$

$$\frac{\Theta; \Psi \vdash_{c_1} T_1 \sqcup_{\text{op}_{\sqcup}} T_2}{\Theta; \Psi \vdash_c (T_1 \sqcup_{\text{op}_{\sqcup}} T_2) \circ_{\text{rel}_{\circ}(c_1, -)} (T_2 \sqcup_{\text{op}_{\sqcup}} T_1)} \text{ E_CHOICESYM}$$

$$\frac{\Theta; \Psi \vdash_{c_1} (T_1 \sqcup_{\text{op}_{\sqcup}} T_2) \sqcup_{\text{op}_{\sqcup}} T_3}{\Theta; \Psi \vdash_c ((T_1 \sqcup_{\text{op}_{\sqcup}} T_2) \sqcup_{\text{op}_{\sqcup}} T_3) \circ_{\text{rel}_{\circ}(c_1, -)} (T_1 \sqcup_{\text{op}_{\sqcup}} (T_2 \sqcup_{\text{op}_{\sqcup}} T_3))} \text{ E_CHOICEASSOC}$$

$$\frac{\Theta; \Psi \vdash_{c_1} T_1 \odot_{\text{op}_{\odot}} (T_2 \triangleright_{\text{op}_{\triangleright}} T_3)}{\Theta; \Psi \vdash_c (T_1 \odot_{\text{op}_{\odot}} (T_2 \triangleright_{\text{op}_{\triangleright}} T_3)) \circ_{\text{rel}_{\circ}(c_1, -)} ((T_1 \odot_{\text{op}_{\odot}} T_2) \triangleright_{\text{op}_{\triangleright}} (T_1 \odot_{\text{op}_{\odot}} T_3))} \text{ E_DISTPARA}$$

$$\frac{\Theta; \Psi \vdash_{c_1} T_1 \sqcup_{\text{op}_{\sqcup}} (T_2 \triangleright_{\text{op}_{\triangleright}} T_3)}{\Theta; \Psi \vdash_c (T_1 \sqcup_{\text{op}_{\sqcup}} (T_2 \triangleright_{\text{op}_{\triangleright}} T_3)) \circ_{\text{rel}_{\circ}(c_1, -)} ((T_1 \sqcup_{\text{op}_{\sqcup}} T_2) \triangleright_{\text{op}_{\triangleright}} (T_1 \sqcup_{\text{op}_{\sqcup}} T_3))} \text{ E_DISTCHOICE}$$

$$\frac{\Theta_1; \Psi_1 \vdash_{c_1} E_1 \quad \Theta_2; \Psi_2 \vdash_{c_2} E_2}{\Theta_1, \Theta_2; \Psi_1, \Psi_2 \vdash_{\text{op}_{\odot}(c_1, c_2)} E_1 \odot_{\text{op}_{\odot}} E_2} \text{ E_PARAI}$$

$$\frac{\Theta_2; \Psi_1 \vdash_{\text{op}_{\odot}(c_1, c_2)} E_1 \odot_{\text{op}_{\odot}} E_2 \quad \Theta_1, (E_1, c_1), (E_2, c_2), \Theta_3; \Psi_2 \vdash_{c_3} E_3}{\Theta_1, \Theta_2, \Theta_3; \Psi_1, \Psi_2 \vdash_{c_3} E_3} \text{ E_PARAE}$$

$$\frac{\Theta_1; \Psi_1 \vdash_{c_1} E_1 \quad \Theta_2; \Psi_2 \vdash_{c_2} E_2}{\Theta_1, \Theta_2; \Psi_1, \Psi_2 \vdash_{\text{op}_{\triangleright}(c_1, c_2)} E_1 \triangleright_{\text{op}_{\triangleright}} E_2} \text{ E_SEQI}$$

$$\frac{\Theta_1; \Psi_2 \vdash_{\text{op}_{\triangleright}(c_1, c_2)} E_1 \triangleright_{\text{op}_{\triangleright}} E_2 \quad \Theta_2; \Psi_1, (E_1, c_1), (E_2, c_2), \Psi_3 \vdash_{c_3} E_3}{\Theta_1, \Theta_2; \Psi_1, \Psi_2, \Psi_3 \vdash_{c_3} E_3} \text{ E_SEQE}$$

$$\frac{\Theta_1, (E_1, c_1), (E_2, c_2), \Theta_2; \Psi \vdash_c E}{\Theta_1, (E_2, c_2), (E_1, c_1), \Theta_2; \Psi \vdash_c E} \text{ E_EX}$$

$$\frac{\Theta; \Psi, (E_1, c_1) \vdash_{c_2} E_2 \quad \text{rel}_{\rightarrow}(c_1, c_2)}{\Theta; \Psi \vdash_{c_2} E_1 \rightarrow_{\text{rel}_{\rightarrow}(c_1, -)} E_2} \text{ E_IMPRI}$$

$$\frac{\Theta_1; \Psi_1 \vdash_{c_2} E_1 \rightarrow_{\text{rel}_{\rightarrow}(c_1, -)} E_2 \quad \Theta_2; \Psi_2 \vdash_{c_1} E_1}{\Theta_1, \Theta_2; \Psi_1, \Psi_2 \vdash_{c_2} E_2} \text{ E_IMPRIE}$$

$$\frac{\Theta; (E_1, c_1), \Psi \vdash_{c_2} E_2 \quad \text{rel}_{\leftarrow}(c_1, c_2)}{\Theta; \Psi \vdash_{c_2} E_2 \leftarrow_{\text{rel}_{\leftarrow}(c_1, -)} E_1} \text{ E_IMPLI}$$

$$\frac{\Theta_1; \Psi_1 \vdash_{c_2} E_2 \leftarrow_{\text{rel}_{\leftarrow}(c_1, -)} E_1 \quad \Theta_2; \Psi_2 \vdash_{c_1} E_1}{\Theta_1, \Theta_2; \Psi_1, \Psi_2 \vdash_{c_2} E_2} \text{ E_IMPLE}$$

$$\frac{\Theta, (E_1, c_1); \Psi \vdash_{c_2} E_2 \quad \text{rel}_{\circ}(c_1, c_2)}{\Theta; \Psi \vdash_{c_2} E_1 \circ_{\text{rel}_{\circ}(c_1, -)} E_2} \text{ E_IMPI}$$

$$\frac{\Theta_1; \Psi_1 \vdash_{c_2} E_1 \circ_{\text{rel}_{\circ}(c_1, -)} E_2 \quad \Theta_2; \Psi_2 \vdash_{c_1} E_1}{\Theta_1, \Theta_2; \Psi_1, \Psi_2 \vdash_{c_2} E_2} \text{ E_IMPE}$$

Definition rules: 21 good 0 bad
Definition rule clauses: 38 good 0 bad